the IBM Personal Computer as their corporation's standard. The managers in the poll represent major corporations in a variety of industries. (The poll was conducted by telephone and was never meant to be a "scientific survey.") Of these managers, six had installed fewer than 10 computers, five had installed between 11 and 50, another five had between 50 and 100, and three had more than 100. The other personal computers favored in as many as two companies were the Xerox Model 820 and the Apple II.

The personal computers mentioned most often as second choices are two models that have been around awhile. The Apple II was listed as the second-most-used personal computer in eight organizations, half of which own more than 10 personal computers; the Tandy/Radio Shack TRS-80 was the second choice of five companies, three of which own more than 10 personal computers. Ford Motor Co., Dearborn, MI, uses more than 400 IBM PCs, Apple IIs, and TRS-80s in its overseas operations. (Ford's standard personal computer in domestic operations is the Victor 9000.)

For most of the respondents, Radio Shack and Apple computers represent early standards. Organizations that have been using personal computers generally started with the Apple II or the Radio Shack TRS-80 Model III and graduated to the IBM PC or a look-alike. "The IBM PC is more expandable than the Apple," one manager comments. "It has more memory capacity and more features like upper- and lower-case letters, high resolution, a lot of disk storage, and a built-in numeric keypad."

"There were many problems with the Apple III in the beginning, and it's too late for a comeback." Belfer, Chase Econometrics/IDC

One computer is highly regarded by some respondents, even though it isn't a favorite in any of the organizations polled. That machine is the Apple Lisa. "Everything on the Lisa is a good example of what software ought to be like," declares Charles C. Hoerner, manager of office systems for McKesson Corp., San Francisco. For Hoerner, software should be easy to use. "Apple has done a fine job with Lisa," he says. "Unfortunately, because so little software is available, Lisa may never be a corporate success. Software creators will continue to beat their brains out in the competitive market for products that run on the IBM PC."

The Apple III, successor to the Apple II, was barely mentioned by respondents. One respondent suggests that the problems that attended the machine's introduction in 1981 are responsible for its lukewarm corporate acceptance. "Apple blew the introduction of the Apple III," says Don Belfer, vice president of computer systems for Chase Econometrics/Interactive Data Corp., in Waltham, MA. He believes the Apple III is still struggling with the poor reputation it earned during its early days. And now that the bugs are finally being worked out, users are implementing more powerful 16-bit personal computers, against which the 8-bit Apple III can't really compete. "There were so many problems with it in the beginning, and now it's too late for a comeback," he says.

"Respondents are acquiring micros equipped with sophisticated tools and greater memory capacity."

Many of the respondents say they and their organizations have cautiously approached personal computing. Twenty-nine percent of the corporations represented have fewer than 10 of the computers designated as the

standards. "We have only four IBM PCs," says James Fortney, manager of management-systems planning for Litton Data Systems, a division of Litton Industries (Van Nuys, CA). "But we only established the IBM PC as our standard two months ago. Besides, we're installing a big local-area network and want to make sure all equipment is compatible before it's installed."

Litton has ordered a dozen more IBM PCs, but Fortney considers the PC an interim machine. "We don't think any vendor has all the right answers," he says. "But because MS-DOS has become the de facto standard in operating systems, and because IBM has its own version (PC-DOS), the PC is our choice."

"Graphics software doesn't provide the high quality managers need."
—Kneitel, Du Pont

Managers in the poll most often mention limited networking and communications capabilities as the drawbacks of personal computers. "Managers want to use computers as multi-function terminals," asserts John Hart, manager of office systems for Avon Products Inc., New York. "They want their computers to communicate with each other and with the world but also to be versatile enough to stand alone."

Avon has made its more than 400 personal computers a major part of operations, according to Hart, and the Eagle Personal Computer, an IBM PC compatible, is the corporate standard. "We're very close to making our personal computers perform as multi-function terminals," Hart says. "We're in a pilot program with Digital Equipment Corp. using personal computers with a VAX 750 super-minicomputer. The VAX works almost as a controller, allowing the personal computers to exchange data."

Compatibility with an existing central computer has become such an important requirement that for many managers it answers the question of which machine is best. "We have

RATINGS OF 25 MANAGERS

	IBM PC/XT	Apple II/III	TRS-80 II/III	Victor 9000	DEC Rainbow	Honeywell MS 610	Xerox 820	Apple Lisa	Eagle PC
Preferred model	17	3	1	1	1	1	2		1
Ratings (1-5)									
Documentation	3.4	3.7		4	4		5	3	3
Ease of use	4	3.4		4	5	5	5	4	5
Return on investment	4.2	5		5			3.75	5	5
Productivity	4.18	4		5	3		4	3	3
Overall rating	3.95	4		4.5	4	5	4.4	3.75	4

	IBM PC/XT	Apple II/III	TRS-80 II/III	Victor 9000	DEC Rainbow	Honeywell MS 610	Xerox 820	Apple Lisa	Eagle PC
Preferred peripherals									
Disk drives									
Davong hard disk	2								
Manufacturer's	14	3		1			2	1	
Pegasus hard disk	1								
Tandon	1								
Taligrass hard disk	1								
Printers									
Anadex	1	1							
C. Itoh		1			1				
Centronics		1							
DEC					1				
Diablo	1							1	
Epson	14	5							
Honeywell dot-matrix							1		
IDS	1								
NEC Spinwriter	3				1				
Okidata	4	1							1
Tandy			2						

IBM mainframes," says Fortney, "and using a single brand reduces maintenance problems." He adds that although the IBM PC is the standard at Litton Data Systems now, future personal computers by Wang Laboratories might be made a co-standard. Litton has Wang minis, as well as IBM mainframes.

Some of the managers in the poll base their personal-computer selections solely on their corporation's networking requirements. As Barry Pierce, manager of information-processing technology for Gilbert/Commonwealth (Reading, PA), says, "We want to build a network of personal computers, word processors, and large computers. Xerox micros meet our requirements. The Model 820 isn't the best personal computer, but it integrates into our system—and that's more important to us than (processing) speed."

The Xerox 820 is a building block in Gilbert Commonwealth's long-range plans for office automation. Its system will eventually comprise 100 workstations, including the Xerox 860 word processor and the 8010 Xerox Star word-processing system. "We chose Xerox computers for their abilities to communicate with each other, to use such Ethernet services as electronic mail, and to access high-speed laser printers," explains Pierce.

The importance of communications even shows up in the respondents' opinions of peripherals. Of the peripherals rated by managers in the poll, those that provided communications—the Irma communications board from Technical Analysis Corp. and Cullinet Software's micro-to-mainframe board—are receiving a lot of attention. "There's also a crying need for software that transmits information from DEC to IBM or DEC to Wang, and so on," adds Hart. "Modems are too error prone for the job."

All of the personal computers rated in the poll fare well in the key categories of ease of use, productivity, and return on investment, although several managers pointed out that the benefits of a personal computer sometimes cannot be measured.

Of course, ease of use, or user friendliness, is a relative term, and managers attach varying degrees of importance to it. "Ease of use is in the mind of the user," asserts Mayford L. Roark, executive director of systems for Ford Motor Co. "A third of any staff has a flair for computing and picks it up unassisted. Another third can be coaxed and trained. But a final third will always have trouble—they have an emotional resistance to the technology."

Does that mean user friendliness is a hoax? Not really. Some computers appear so difficult to use that both enthusiastic and reluctant users become intimidated and never learn to use them.

On a more specific note, Litton Data Systems' Fortney blasts IBM's selection of a nonstandard keyboard for the IBM PC. "I don't understand IBM's approach to the PC's keyboard," he says. "People who have been using the IBM 3270 terminal are lost when they sit down at the PC." The Apple II's keyboard isn't any better, he continues. "Apple has a truncated keyboard that doesn't

"Managers most often mention limited networking and communications as the drawbacks of personal computers."

have function keys."

Fortney believes a "shell," a feature that provides menus with user instructions or prompts, would be helpful on the IBM PC. "Wang requires front ends on all software written for its personal computers," he says. "Menus are better than memorizing commands. Not only are such systems easier to learn, they also are easier for an infrequent user to understand."

Despite the personal computer's highly touted ability to raise productivity, managers in the poll have a tough time quantifying increases. True, a computer may help an employee complete a task in less time, but it also permits more iterations of the task to be performed. The amount of time saved is not as important as what's done with it, the managers say. "Personal computers let you trade time for quality," says Gilbert Commonwealth's Pierce. "When a proposal is prepared manually, there's usually only enough time for one or two drafts. But the ability to easily write and rewrite on a personal computer lets a professional produce a more accurate and well-rounded proposal."

Playing devil's advocate, Pierce points out a problem associated with the greater capabilities personal computers give workers. "Let's say the computer prevents a $1 million mistake on a proposal. If your incorrect figures were a million dollars too low, the computer would have cost you money. If they were a million dollars too high, the computer would have made you money."

Computers provide a fast return on the money invested in them, largely because of their

(Continued on page 118)

RATINGS OF 25 MANAGERS

	IBM PC/XT	Apple II/III	TRS-80 I/III	Victor 9000	DEC Rainbow	Honeywell MS 610	Xerox 820	Apple Lisa	Eagle PC
Preferred applications packages									
Spreadsheets									
1-2-3	17						2		
Multiplan	4						2		1
Perfectcalc (Eagle Calc)							1		1
Report Manager (Victorcalc)				1					
Supercalc	1				1				
Visicalc	6	4	1						1
DBMSs									
Condor	1						2		
dBase II	4	2			1		1		1
DB Master		1							
Focus	2								
General Manager		1							
Infostar					1				
PC File									1
PFS:File/Report	1	1							
Profile Plus			1						
Sequitur	2								
TIM	1			1					
Visifile		1							
Communications packages									
3101 Emulation	1								
Crosstalk	2				1				
Manufacturer's	4						1		
PC/Intercom	1								
Saturn									1
Softerm		1							
Smartcom II	1								
Symware 3270A	1								

PERSONAL COMPUTING SURVEY

(Continued from page 114)

low cost. "Personal computers pay for themselves in much less time than our two-year payback standard," says Avon's John Hart. "In addition, although we're using the machines for the purpose we originally intended, users are taking them beyond our original expectations, providing us with an even better return on investment."

In the same vein, managers say what counts is not *how much* time is spent at a computer, but *how effectively* that time is spent. "It's like a telephone," says Rockwell's Howard Ingram. "You don't expect someone to talk on one for eight hours a day, do you?"

The poll suggests several trends in computer configurations. The respondents are acquiring personal computers equipped with increasingly sophisticated tools and greater memory capacity. Most of the machines typically have 256,000 bytes of main memory, two double-sided disk drives (or in an IBM PC XT configuration, one disk drive and a vendor-supplied hard disk), an Epson printer, a vendor-supplied monochrome monitor, serial and parallel ports, and a Smartmodem, from Hayes Microcomputer Products, operating at 300 or 1,200 bits per second.

However, computers purchased since the first quarter of last year suggest that managers have changed their equipment priorities. Those machines typically have 512,000 or more bytes of memory, color monitors, hard disks (often made by an independent vendor, since the PC XT has been in short supply), 1,200-bps Hayes modems, and Epson printers.

"A third of any staff has a flair for computing. Another third can be trained. But a final third will always have trouble." Roark, Ford

What does this trend toward more-powerful, better-equipped systems mean? "Most of the new user-friendly software includes online help functions, which require a lot more random-access memory (RAM) than older packages," says Litton Data Systems' James Fortney.

Even managers who don't have machines with large memory capacities emphasize the need for more memory. "We've bought upgrades to the Xerox 820 to make it both an 8- and a 16-bit machine, with 128,000 bytes of RAM in the 16-bit version," comments Gilbert/Commonwealth's Pierce. Another manager says his employer is loading its Apple IIs with "as much memory as they can handle—96,000 bytes, 128,000 bytes, or whatever."

Epson is the most popular line of printers among the responding managers, perhaps because IBM markets printers made by Epson. (If one of the managers surveyed has the IBM or any other manufacturer-supplied printer, the charts tally the vote for its actual manufacturer, if known—Epson for IBM, C. Itoh for Apple, and so on.) Okidata's printer was mentioned as a favorite by several companies, and the NEC Spinwriter was used as a secondary printer for word processing. The Hewlett-Packard 7470A Plotter was the only plotter mentioned by the respondents.

The most prevalent applications in the organizations represented in the poll contain few surprises. Spreadsheet analysis and database management are the most popular personal-computing tasks. Few managers mention word processing, perhaps because of the widespread assumption that word processing is a clerical task and because many secretaries already use dedicated word-processing equipment.

Responses from the managers suggest, however, that word processors are becoming passe as more and more corporations begin using personal-computer word-processing software like Multimate from Softword Systems on their micros. "The word-processing packages for personal computers are getting better," says Charles Hoerner of McKesson. He doesn't doubt that personal computers will eventually mean the end of word processors, but only after another round of improvements for word-processing packages. "The software and keyboard still don't quite match the best of the dedi-

"Ease of use is in the mind of the user."
—Roark, Ford

cated word processors," he explains. "Before, when users needed word processing, we told them to buy a word processor. Now we steer them toward personal computers."

Accounting isn't a widespread use for personal computers in the corporations represented in the poll. Indeed, the managers discourage use of accounting packages on stand-alone machines, fearing the corporate books will be muddled.

Graphics is apparently an application that hasn't yet found favor in corporations. "Graphics software doesn't produce the high quality managers need for business graphics," complains Arnold Kneitel, systems consultant for E I. du Pont de Nemours, Wilmington, DE. "We need more precision, greater resolution, and a smoother line."

Many of the managers in the poll complained about the dearth of computer furniture. "Furniture design and the amount of space in a personal-computing workstation are important issues," says James Fortney. "There's a tendency to reduce the space allotted to employees, but to increase productivity you have to equip them with tools, which take up space. There's a big need for office furniture designed to accommodate computers."

Although most of the managers agree with Fortney, few are using special furniture. "The return on investment isn't there with ergonomic furniture," McKesson's Hoerner comments. "How do you justify buying an $800 chair?"

When it comes to the best way to purchase computers, the managers are almost evenly divided between buying direct from manufacturers and buying from dealers. (Independent sales organizations aren't prevalent among the organizations represented in the poll, and turnkey suppliers aren't used at all.) Most firms are so uncertain of the advantages of either major purchasing strategy that they purchase from dealers *and* manufacturers—despite disappointing ratings for both. IBM, in particular, draws harsh criticism for the inferior quality of its sales support.

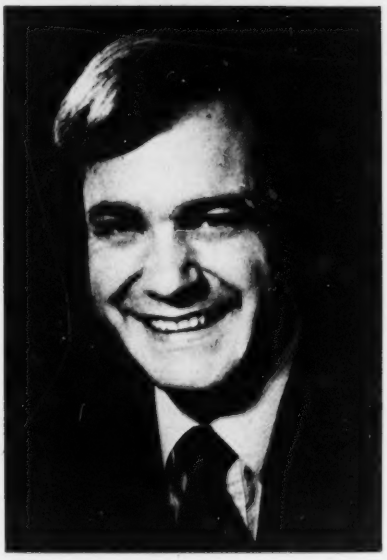
"We don't think any vendor has all the right answers."
—Fortney, Litton

"IBM's pre-sale support is abominable," says Hoerner. "Sales reps in its product centers think they know everything, but they don't. One guy insisted to me that the Displaywriter (a dedicated word processor) couldn't communicate with the IBM PC. He was wrong, of course. Another time, we were put on the waiting list for some boards that were out of stock, but were never called when the boards came in. IBM should forget retailing."

Big Blue admits that the success of its personal computer has led to delayed shipments of computers and parts, but adds that the product centers will soon have streamlined supply lines. An IBM spokesman also divulged plans to set up a toll-free customer-service hot line. *(Continued on page 120)*

RATINGS OF 25 MANAGERS

	IBM PC/XT	Apple II/III	TRS-80 II/III	Victor 9000	DEC Rainbow	Honeywell MS 610	Xerox 820	Apple Lisa	Eagle PC
Maintenance and support ratings (1-5)									
Hardware									
Dealer	3.2	4			5				4.5
Manufacturer	3			5		4	5		
ISO	3.5								
In-house	4.7								
Software									
Dealer	3.8								
Manufacturer	3.5	5		5	4		2		3
ISO									
In-house	5	5							
Training									
Dealer	3.6								
Manufacturer				5					
ISO									
In-house	4.4				4.5				



"IBM's pre-sale support is abominable. Sales reps in its product centers think they know everything, but they don't."
Hoerner, McKesson

(Continued from page 119)

The spokesman also insisted that "the only way an IBM PC and a Displaywriter can communicate is through a 5520 administrative system." Hoerner, however, maintains that "the connection is a trivial matter, involving a $750 interface, an asynchronous modem, and an acoustic coupler." This comes as no surprise, however. Most managers in the poll agree that none of the major computer manufacturers is helping to meet end-user needs. "That's understandable," Hoerner reasons. "The major vendors are pumping out iron. The really creative solutions are coming from software companies. Hardware manufacturers don't and shouldn't have the vision to market software solutions." (Of course, it can be argued that some hardware vendors are striving for better software solutions like those found on Apple Computer's Macintosh.)

Although many of the companies represented in the poll provide their own hardware support, most rely at least partially on their vendor's toll-free hot line for solutions to software problems. These phone services receive mixed reviews at best. Ashton-Tate's hot line for its dBase II database management system is "deplorable," asserts one manager, whereas Softword Systems' hot line for its Multimate word-processing package is called "outstanding" by another. Managers somewhat immodestly rate their own in-house support services as vastly superior to outside sources.

When asked which components break down most often, the typical response was, "Components really don't break down that often, but when they do it's usually the disk drives." The fact is, personal computers don't frequently break down. "Personal computers are much more reliable than mainframes," Hart says. "But they're so cheap we keep spares in case they fail."

Still, when the need for maintenance arises, many managers consider on-site maintenance their best option. The University of Arizona is one extreme—its micros for agricultural research are located in every county in the state. "On-site maintenance is an absolute necessity for us," comments Robert MacArthur, a systems analyst. "We can't afford to have personal computers shipped to a central location for repair."

McKesson Corp.'s circumstances are less extreme, but "We give all our Personal Computers on-site maintenance," Hoerner reports. "Employees take too much time to bring their machines back to the source for repair."

Corporations represented in the poll train employees themselves. Many have informal, one-on-one training or "neighbor help," as Rockwell's Ingram calls it. Some training programs are more extensive. A typical course includes an introduction to personal computers plus individual courses on each popular software package, like 1-2-3, Supercalc, or Wordstar. "We tried producing and distributing videotapes," Ingram says, "but it didn't work. An instructor is needed to answer questions. And the student needs to set the pace."

The subject of technical documentation was greeted by a managerial yawn in most cases. "Ninety-nine percent of our users never even bother to read the documentation," says Hoerner. "Reference guides are only important during training. Employees don't care about manuals," he says. "They want software packages that are self-explana-

"No machine is head and shoulders above any other."
—Ingram, Rockwell Int'l.

"When managers acquire personal computers, they don't expect to get the perfect machine."

tory and have an online 'help' screen."

Avon has made its manuals a little more friendly, according to Hart. "The documentation is very good, but it's a little extensive," he says. "We put together a mimeographed set of instructions that reduces the size of the technical documentation nine-tenths."

All in all, the managers say they're pleased with their choices. But whether this satisfaction indicates that any one brand is superior is questionable. After investing a chunk of the company's assets in a product, a manager is unlikely to voice displeasure with any purchase, good or bad.

Most managers also report strong acceptance of their choices by employees, another claim that must be qualified. Pierce of Gilbert/Commonwealth believes employees will accept any machine. "If you walked everywhere and I bought you a car, you might suggest ways to make the car run better, but you'd sure be happier with it than you were without it," he reasons.

"Seventeen of the 25 managers polled have chosen the IBM Personal Computer as their corporation's standard."

What conclusions can be drawn from the opinions of 25 managers? Certainly no product can be called "the best" or "the worst"—though the IBM PC can be safely dubbed "the most widely used." What can be gleaned from this survey is that selecting the right computer depends on your needs today, your long-range plans for networking and communications, and your requirements for software and peripherals. Look at the big picture before you commit your corporation to hardware. □

Jordan Gold is a Fort Worth, TX-based free-lance writer.

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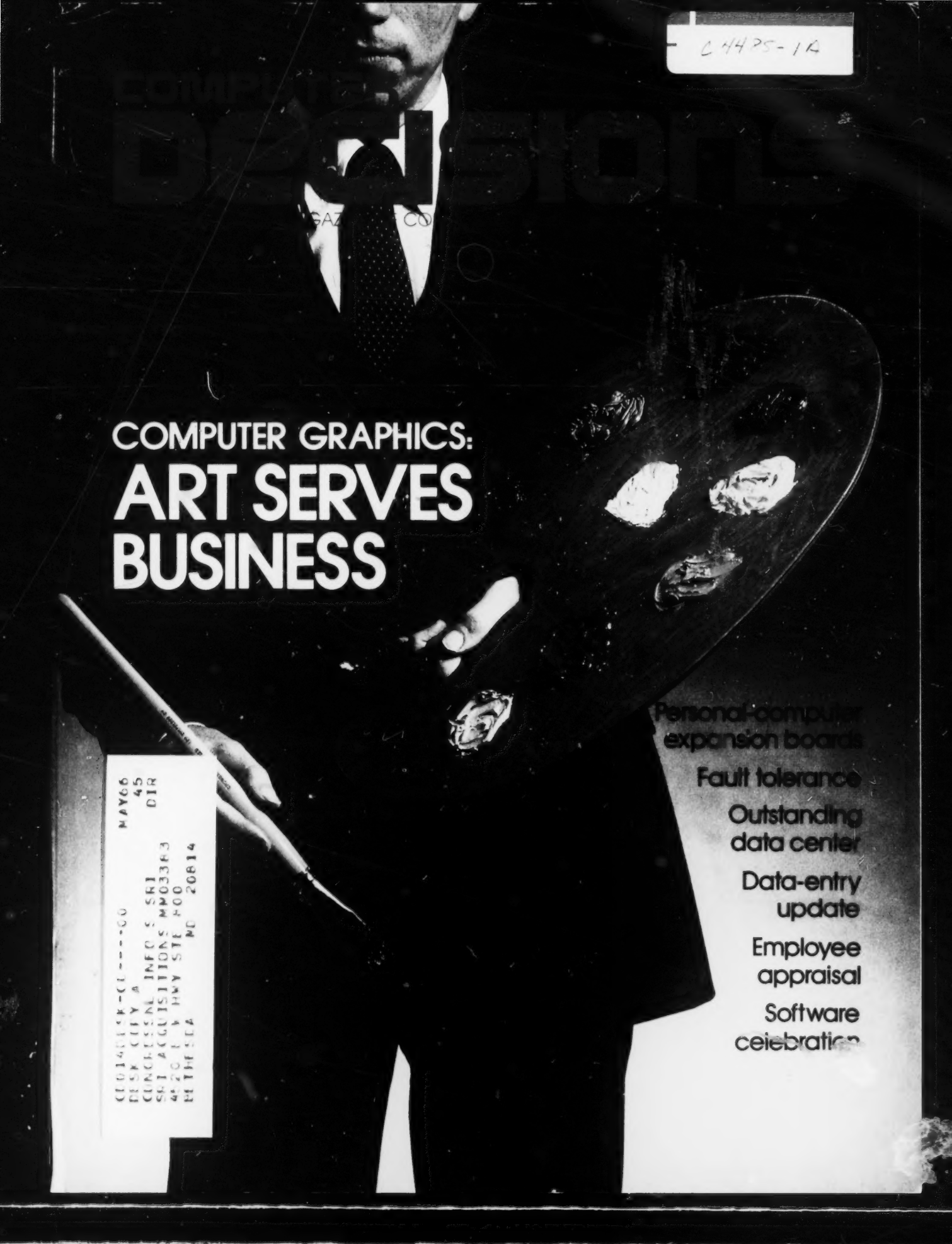

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COVER PHOTO: Edward Hardin

OFFICE AUTOMATION

The vogue in OA is formality

Formality has become the key word in office automation. Although this is particularly true in giant corporations, even medium-sized and small companies are bringing institutional authority to bear on OA decision-making. The trend reveals a general belief that coherent, carefully conceived plans and procedures will successfully raise the output and effectiveness of office workers.

The movement toward formal plans and procedures in office automation is described in a new study by The Omni Group Ltd., an office-systems consultancy based in New York. "The Office Automation Challenge: American Business Responds" is based on interviews with nearly 850 managers responsible for planning or purchasing office systems in large, medium-sized, and smaller companies.

More than half of the nation's largest corporations already have strategic plans to automate their offices, according to the survey. By next year, almost 85 percent of the largest industrial and service corporations expect to implement plans governing the way word processors, personal computers, electronic-mail systems, and other OA tools are evaluated, purchased, and installed.

Management lends a primarily supportive role to OA efforts, especially in the larger organizations, but many players are involved in corporate planning and purchasing. In Fortune 500 corporations, OA policy is usually the responsibility of a special committee or a single department charged with creating a strategy, according to the survey results. In either case, the data-processing or management-information systems (MIS/dp) department plays a major role in formulating policies.

When it comes to purchasing OA systems, the survey results suggest that users themselves have much of the authority. "The person who signs the check is not necessarily the one who writes the policy," notes Randy J. Goldfield, president of The Omni Group. The end user's important role is underscored by the significant amount of discretionary spending on OA outside of normal cost-justification procedures.

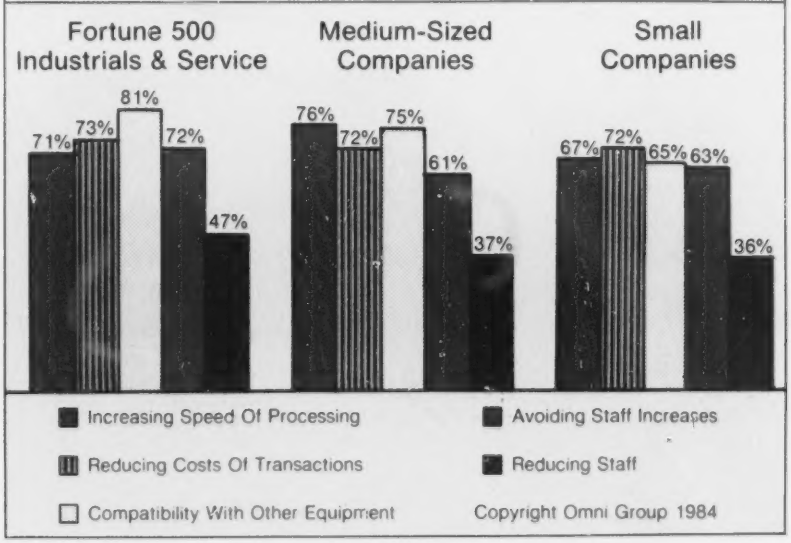
According to the survey results, data analysis is the most popular application of systems among managers and professionals. Data processing is next. In addition to data processing, transaction processing—tasks like order entry and inventory control—ranked highly among medium-sized and small businesses. "Outside of the Fortune 500, businesses can't support full-blown dp and office systems departments," says Warren Waldbrand, Omni's research director. "These functions seem to merge."

The survey also suggests that many of the most-heralded applications are not heavily used by many corporations. Electronic communications, for example, is regarded as a key application by less than 20 percent of the large corporations in the survey, and less than 10 percent of the small operations. Graphics, another much-touted application, also is not highly valued by corporations.

The survey results also suggest that staff reduction, a widely touted benefit of OA, is not vital to corporations. Rather, respondents want to raise the effectiveness and speed of office transactions. □

OA Purchasing Objectives

Percent of companies who answered "very" or "extremely important"



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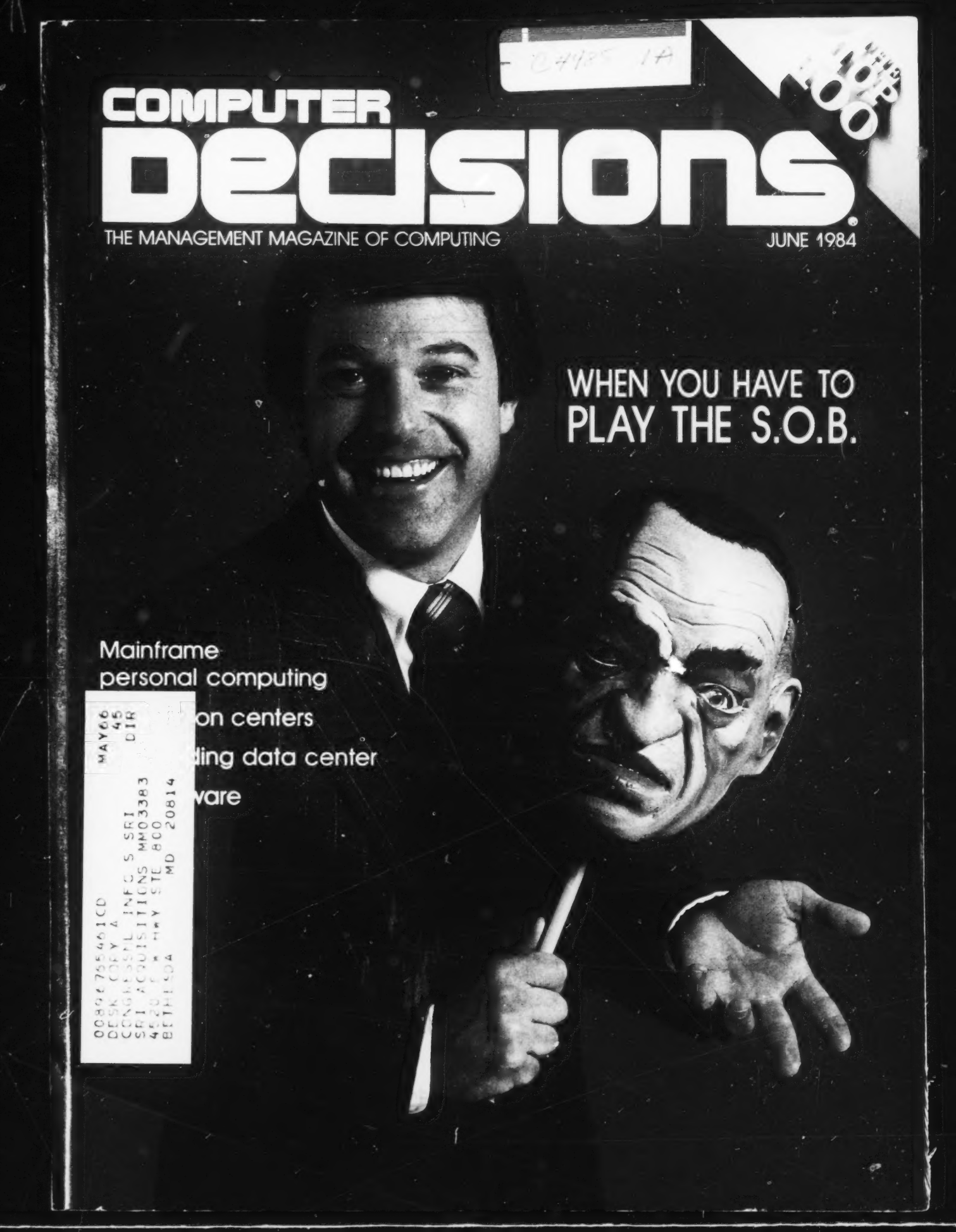

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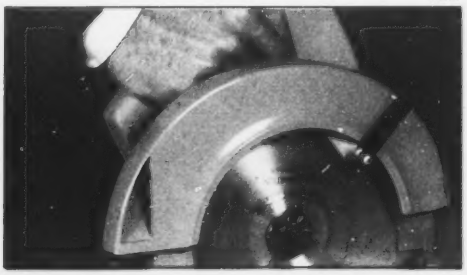

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news & comment

More advise than consent on micros

The role of most MIS/dp departments in the acquisition of personal computers and microsystems is to assist and advise, rather than to approve. Of 155 top-level MIS/dp executives responding to a recent survey, slightly more than half said their role is to advise, while 37 percent said it is to review and approve. Nearly one-quarter of the respondents believed their role encompasses both extremes.

The results of the survey by Newton-Evans Research Co., Baltimore, are included in "Microcomputer Usage Trends in Fortune 1,300 Corporations," a report.

Another key finding of the survey was the seeming dissatisfaction of MIS/dp executives with supermicrocomputers, defined as 16- and 32-bit multi-tasking systems supporting many terminals. Three out of four respondents said supermicros are unnecessary. More than one-third (36 percent) indicated that they have no supermicros and no plans to purchase them. Only 15 percent said they have supermicros, and 26 percent expected to acquire one or more by the end of next year.

The respondents also downplayed the importance of portable computers. Nearly one-half (48 percent) said they don't envision widespread use of portables in businesses. Eighteen percent said portables would play a major role in corporations, and one-third were unsure. Portables will mostly be used by sales representatives, systems analysts, and professional users who are not managers or clerical workers, according to the respondents. But some executives, managers, and clericals will also use the machines.

Other findings include:

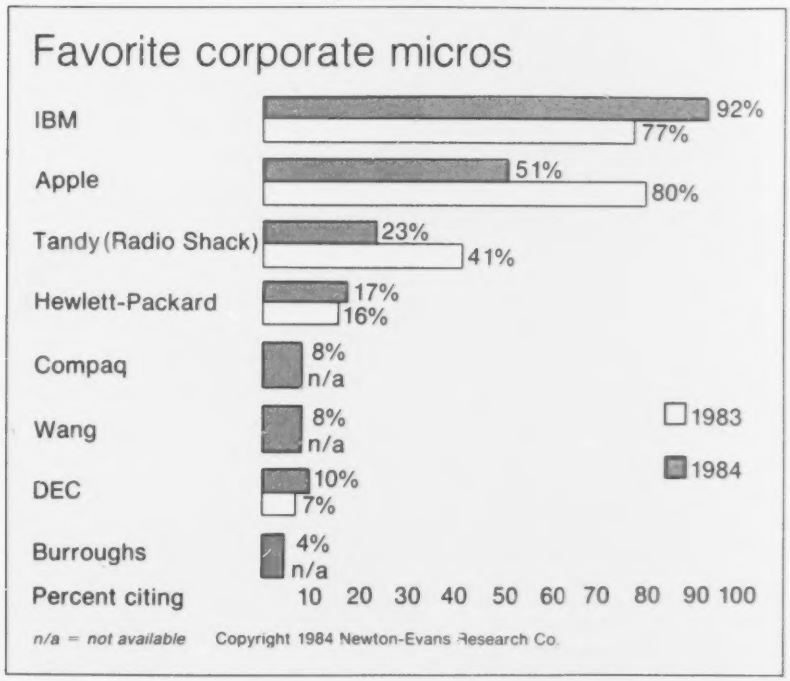
- By the end of 1985, about 420 microcomputers will be installed in the average Fortune 1,300 corporation.
- About 52 percent of these desk-top personal computers will be assigned to professionals. Executives and managers will have about 23 percent and clerical staff members will have the remainder.
- The biggest fear about personal computers in Fortune 1,300 companies is the possibility of security or privacy breaches (cited by 44 percent of the respondents).
- Long-term "supplier viability" is the most powerful influence on microcomputer selection. Others are "connectability" (cited by 47 percent) and "software availability" (33 percent).

The microcomputer manufacturer represented in the most responding corporations was—you guessed it—IBM. Of 155 respondents, 142 reported owning IBM micros. Two-thirds of the respondents said they had no plans to buy personal computers from other suppliers.

Newton-Evans also asked the respondents about acquisition policies. Twenty-three percent said their organizations don't have an effective personal-computer-acquisition policy.

The most frequently mentioned microcomputer application was spreadsheet analysis, cited by 95 percent of the respondents. Word processing, mentioned by 91 percent, ran a close second. Business graphics was the third most frequently mentioned application. Micro database management systems (DBMSs) are also important to many corporations (60 percent), but more than one-quarter of the respondents said micro DBMSs are unnecessary.

The 250-page report costs $750. For information, contact Newton-Evans Research Co. at (301) 465-7316. (News continued on page 16)



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SPECIAL PULLOUT SECTION

THE TOP 100

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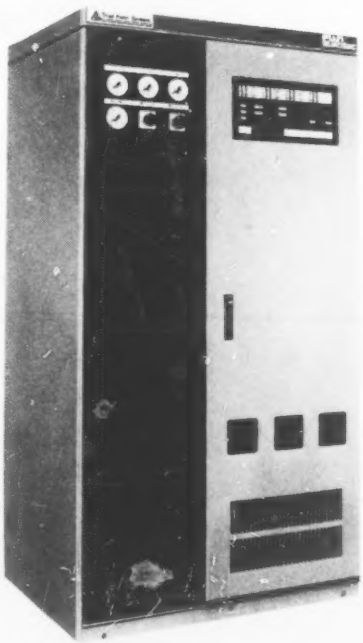
BY

There is a new kid on the UPS Block . . . Who isn't new!



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CIRCLE 101

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